

### **REMARKS**

This Amendment is submitted in reply to the Office Action dated June 23, 2004. Applicants respectfully request reconsideration and further examination of the patent application under 37 C.F.R. § 1.111.

Upon entry of the foregoing Amendment, Claims 1, 4, 7-9, 12, 15-18, 21, 24-25 and 33-44 are pending in the application. The amendments are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding objections and rejections.

#### **Previously Filed Information Disclosure Statement**

Enclosed is a copy of an Information Disclosure Statement that was mailed to the USPTO on March 4, 2002. Applicants respectfully requests consideration of the Information Disclosure Statement.

#### **Summary of the Examiner's Rejections**

The drawings were objected to because they did not include the reference characters 102a and 102b.

Claims 26-31 were rejected under 35 U.S.C. 112 (second paragraph) as being incomplete for omitting essential steps where such an omission amounts to a gap between the steps.

Claims 1-4, 7 and 8 were rejected under 35 U.S.C. 102(b) as being anticipated by Elmer.

Claims 1, 5 and 6 were rejected under 35 U.S.C. 102(b) as being anticipated by Cortes.

Claims 9-10, 15-19 and 24-31 were rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington (US 5,637,202).

Claims 11-12 and 20-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington (US 5,637,202) in view of Elmer.

Claims 13-14 and 22-23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington (US 5,637,202) in view of Malik (US 2003/0213732) and Cortes.

Claim 32 was rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington (US 5,637,202) in view of Kaltenbach (US 5,641,400) with further support provided by Guzman (US 5,202,010).

#### **Summary of Amendment**

Applicants have cancelled Claims 2-3, 5-6, 10-11, 13-14, 19-20, 22-23 and 26-31 (without prejudice), amended independent Claims 1, 4, 9, 12, 17, 21 and 32, and added Claims 33-44 to more particularly define the present invention.

#### **Remarks regarding objected Drawings**

The drawings were objected to because they did not include the reference characters 102a and 102b. Enclosed is replacement sheet illustrating FIGURES 3 and 4 where "300" was changed to --102a-- in FIGURE 3, and "400" was changed to --102b-- in FIGURE 4. Applicants have also amended the Specification so it corresponds with the aforementioned changes to FIGURES 3 and 4. Accordingly, Applicants respectfully request removal of this objection.

#### **Remarks regarding §112 (second paragraph) rejection**

Claims 26-31 were rejected under 35 U.S.C. 112 (second paragraph) as being incomplete for omitting essential steps where such an omission amounts to a gap between the steps. Applicants have cancelled Claims 26-31 (without prejudice). Accordingly, Applicants respectfully request removal of this rejection.

#### **Remarks regarding §102(b) and §103(a) rejections**

Applicants respectfully submit that amended independent Claims 1, 9 and 17 are patentable over Elmer, Harrington, Malik, Cortes, Kaltenbach and/or Guzman. The independent Claim 1 (for example) follows:

1. An electrophoretic inorganic porous material, comprising:  
an alkali borosilicate glass that has a plurality of pores therein through which molecules migrate during an electrophoresis process; and  
said alkali borosilicate glass is coated with a non-charged coating material (emphasis on the distinguishing limitations).

Amended independent Claims 9 and 17 contain the same distinguishing limitation which was recited in pending independent Claim 1.

As indicated above, the amended independent Claims 1, 9 and 17 each recite a limitation where the alkali borosilicate glass is coated with a non-charged coating. The use of a non-charge coating on the alkali borosilicate glass (e.g., inorganic porous material 102a) is important to the present invention for several reasons as was stated in the patent application starting on page 10, line 24 as follows:

"It should be understood that the surface of the inorganic porous material 102a and 102b is negatively charged under most pH buffer conditions. There are two problems associated with having a negatively charged surface. First, proteins with positive charges are adsorbed on surface, which reduces separation resolution. Secondly, it is difficult to control

the electro osmotic flow which is very sensitive to the buffer condition and surface condition on pores in the inorganic porous material 102a and 102b. This poor control in turn causes poor reproducibility of separation. For these two reasons, it is important to suppress the surface charge on the inorganic porous material 102a and 102b. To accomplish this, a non-charged coating material (e.g., polyethylene glycol (PEG)) can be used on the silica surface."

Applicants respectfully submit that Elmer and/or Harrington fail to teach where an alkali borosilicate glass or any type of glass for that matter is coated with a non-charged coating. Malik, Cortes, Kaltenbach and Guzman fail to cure this defect. Accordingly, Applicants respectfully submit that the aforementioned substantial difference between Elmer, Harrington, Malik, Cortes, Kaltenbach and/or Guzman and the amended independent Claims 1, 9 and 17 and their associated dependent Claims 4, 7-8, 12, 15-16, 18, 21, 24-25 and 32-33 are indicative of the patentability of the present invention.

Referring now to added independent Claims 34, 38 and 41, Applicants respectfully submit that amended independent Claims 34, 38 and 41 are patentable over Elmer, Harrington, Malik, Cortes, Kaltenbach and/or Guzman. The independent Claim 34 (for example) follows:

34. An electrophoretic inorganic porous material, comprising:  
a sol gel monolith that has pores formed therein which have an average diameter in the range of 30-400 angstroms through which molecules migrate during an electrophoresis process (emphasis on the distinguishing limitations).

Added independent Claims 38 and 41 contain the same distinguishing limitation which was recited in added independent Claim 34.

As indicated above, the added independent Claims 34, 38 and 41 each recite a limitation where a sol gel monolith has pores which have an average diameter in the range of 30-400 angstroms. The support for this limitation can be found in TABLE 1 of the patent application which is provided below:

TABLE 1

| Pore Radius Å<br>(Nominal) | H <sub>2</sub> O<br>(ml) | CH <sub>3</sub> OH<br>(ml) | TMOS<br>(ml) | HF (3%)<br>(ml) | HNO <sub>3</sub> (IN)<br>(ml) |
|----------------------------|--------------------------|----------------------------|--------------|-----------------|-------------------------------|
| 30                         | 50                       | 0                          | 35           | 1.5             | 10                            |
| 45                         | 50                       | 0                          | 35           | 2.5             | 10                            |
| 100*                       | 25                       | 50                         | 35           | 4               | 4                             |

|      |    |    |    |   |   |
|------|----|----|----|---|---|
| 150* | 25 | 50 | 35 | 12.5  | 4 |
| 200* | 50 | 50 | 35 | 10  | 4 |
| 250* | 50 | 50 | 35 | 12.5  | 4 |
| 400* | 50 | 50 | 35 | (2.25 ml of 25% H <sub>2</sub> SiF <sub>6</sub> ) | 0 |

\* Indicates reactants cooled in an ice bath (approx. 5°C) prior to mixing. TMOS = tetramethoxy silane.

Applicants respectfully submit that Cortes, Harrington and/or Malik fail to teach where a sol gel monolith has pores which have an average diameter in the range of 30-400 angstroms. Instead, as indicated by the Examiner, Cortes disclosed a gel that has pores with diameters in the range of 3000-5000 angstroms (page 446). Harrington disclosed polymer sponges that have pores sizes of sufficient size to allow electrophoretic migration of proteins or nucleic acids, and further disclosed preferred ranges of 0.1µm to 25µm (1000Å to 250,000Å) for proteins and 1µm to 100µm (10,000Å to 1,000,000Å) for nucleic acids (col. 5, lines 26-41). And, Malik disclosed a separation media made of a gel like the one taught in Cortes (par. 0015). Malik also disclosed a separation media made of a sol-gel monolithic column that has pores with diameters of approximately 1.5µm (15,000Å) (par. 0044). Elmer, Kaltenbach and Guzman fail to cure this defect. Accordingly, Applicants respectfully submit that the aforementioned substantial difference between Elmer, Harrington, Malik, Cortes, Kaltenbach and/or Guzman and the amended independent Claims 34, 38 and 41 and their associated dependent Claims 35-37, 39-40 and 42-44 are indicative of the patentability of the present invention.

## Conclusion

Applicants respectfully submit that all of the stated grounds of objections and rejections have been properly traversed, accommodated, or rendered moot. Accordingly, Applicants respectfully request reconsideration of all outstanding objections and rejections and allowance of pending Claims 1, 4, 7-9, 12, 15-18, 21, 24-25 and 33-44.

Enclosed is a USPTO Credit Card Payment Form filled out for \$ 426.00 to cover the fee for three additional independent Claims 34, 38 and 41 and nine additional dependent Claims 33, 35-37, 39-40 and 42-44. If this is incorrect, the Commissioner is authorized to charge any fees which may be required for this paper to Deposit Account No. 50-1481.

Respectfully submitted,



---

William J. Tucker  
Reg. No. 41,356  
(903) 489-2198

Corning Incorporated  
Attn: Thomas R. Beall, Esq.  
SP-TI-03-1  
Corning, NY 14831

**In the Drawings**

Enclosed is a replacement sheet illustrating FIGURES 3 and 4 where "300" was changed to --102a-- in FIGURE 3, and "400" was changed to --102b-- in FIGURE 4. Applicants respectfully request that the Examiner and Draftsman review and approve these changes to FIGURES 3 and 4.